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LEGUMES BOOST BANANAS

by Bob Stanley

Twenty kilometres from Panama City, right next door to the capital's shiny new airport at Tocumen, are the fields and buildings of the University of Panama's agriculture research station.

The roar of the big jets passing just a few hundred feet overhead makes this seem somehow an incongruous setting for even an experimental farm. Yet the planes also serve as a reminder that the research being carried out here involves scientists and farmers not just in Panama but in neighbouring countries and around the world.

One experiment in particular here could have international significance. In one corner of the farm is a fenced half-hectare plot containing neat rows of young banana trees, all bearing their first green fruit. It could be any small banana plantation except for what is growing underneath the trees - rectangular plots of assorted green plants. Many of these plants look familiar, resembling beans, groundnuts, and other crops. They are in fact all legumes - and some of them may soon be helping to solve two of the banana growers' biggest problems.

Problem number one is the banana plant's appetite for nitrogen. In order to achieve good production levels the farmer must apply about 400 kg of nitrogen to every hectare of bananas - every year.

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The cost of chemical fertilizers has increased manyfold in recent years, and prices are still rising. The result has been to push many small producers close to their financial limits - some have already been forced out of production, others soon will be.

Bananas, and their close relatives the plantains, are important food crops not just in Panama but in most tropical developing countries. Although short on protein, they are rich in carbohydrates and vitamins A and C. But most of the bananas found in the local markets come from the small producers, nto the large plantations operated by the multi-nationals and geared exclusively for export. So if the small producers go under an important local food source is lost.

Problem number two is rain. Bananas need lots of water, which is why they grow best in the humid tropics. But heavy tropical rains continually wash away the topsoil - and probably at least a quarter of the precious nitrogen goes along with it. The result is a gradual depletion of the soil, and a huge waste of nitrogen fertilizer.

The plants growing in the banana plantation at the University's agricultural research station are tropical legumes. They all have the ability, common among leguminous plants, to produce their own nitrogen. They do it by extracting nitrogen gas from the air and fixing it in the soil through an interaction with soil bacteria called rhizobia. Scientists have shown that a healthy ground cover of tropical legumes can "fix" as much as 250 kg of nitrogen per hectare per year.

Farmers in many countries often intercrop food legumes such as cowpeas in with other crops because of their beneficial effects. And

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in Africa tropical legumes are used successfully in palm and cacao plantations. The project in Panama is trying to find out if local legume plants will work as well in banana plantations.

This is an international project. It is jointly funded by the Union of Banana Exporting Countries (UPEB) and Canada's International Development Research Centre (IDRC). UPEB represents seven countries - Colombia, Costa Rica, Dominican Republic, Guatemala, Honduras, Nicaragua, and Panama - and coordinates a research network involving scientists at 20 institutions in its member countries.

The head of UPEB's research programme is Dr. Rodriguo Tarte. He stresses the importance of banana and plantain production to the region's economy. UPEB is concerned with both domestic and export markets; large and small producers; and with all aspects of banana production, processing and distribution. The importance of the legume experiments, says Dr. Tarte, lies not just in the plants' ability to fix nitrogen, but in their potential for improved management practices: they can help control both soil erosion and the growth of weeds, and in the long run should also help improve the soil structure.

But as researcher Netodio Rodriguez explains, not just any leguminous plant will do the job. The ideal plant should have good nitrogen fixing capacity, but it must also be able to thrive in the shade of the banana plant's broad leaves and to compete successfully with weeds. The plant should be low on the ground, not the type that tends to climb, and should be tough enough to survive being walked on repeatedly by plantation workers.

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If that sounds like a tall order, Rodriguez is also hoping they can find legumes that will serve an additional purpose - as animal feed. He is also working on an animal production project at the University farm which is supported by IDRC and the Ministry of Agriculture.

Nine different legume plants are being tested on the experimental plot at the farm. Some of them are local plants from Panama, other were provided by the International Centre for Tropical Agriculture (CIAT) in Colombia. Later this year the best of them will be tested under more trying conditions on a number of banana plantations throughout the country with the help of the state banana corporation, COBAPA.

If the results are favourable, Dr. Tarte estimates the legumes could wind up saving farmers millions of dollars in fertilizer costs. And, more important, it should help many of the smaller producers to stay in business, providing bananas and plantains for the market places of the region.

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